DOCUMENT RESUME

ED 377 822 IR 016 938

AUTHOR White, Daniel C.
TITLE Improving the Student's Use of Computers within the Middle School Curriculum through a Multi-Faceted Approach of Increased Computer Accessibility and Varied Teaching/Learning Strategies.
PUB DATE 93
NOTE 99p.; Doctoral Practicum Report, Nova University.
PUB TYPE Dissertations/Theses - Practicum Papers (043)

EDRS PRICE MF01/PC04 Plus Postage.
DESCRIPTORS Cognitive Development; Competence; Computer Assisted Instruction; *Computer Literacy; *Computer Uses in Education; *Curriculum Development; Elementary School Teachers; *Grants; *Inservice Teacher Education; Intermediate Grades; Junior High Schools; Laboratories; Learning Strategies; Middle Schools; *Peer Teaching; Problem Solving; Secondary School Teachers; Thinking Skills

ABSTRACT

Middle school students are failing to connect what is learned in computer classes to other subject areas of the school's curriculum. Teachers, who often lack basic computer knowledge, are not encouraging computer use, and a lack of computer accessibility and appropriate software compound the problem. A practicum was designed to: (1) move the school's computer lab to a more accessible area; (2) conduct teacher inservice training in different aspects of technology and its application to various subject areas; (3) write grants for additional computers; (4) review and rewrite middle school technology curriculum; and (5) establish cooperative and peer tutoring groups within the computer lab. After implementation, computer lab utilization (hours used) by students and teachers increased 30%. Four out of 16 grants written were approved (a 400% increase), and students demonstrated an average competency skills rating of 75%. The training was well-received by the staff and their technology use skills increased. Eight appendices include a staff questionnaire related to educational technology, student post-tests, teacher evaluations of inservices, a map of a proposed move of the computer lab, agendas for inservice training, a checklist of observations in the computer lab, the technology curriculum, and the administrative response to inservices. (Contains 16 references.) (MAS)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☐ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

ED 377 822

Improving The Student's Use Of Computers Within The Middle School Curriculum Through A Multi-Faceted Approach Of Increased Computer Accessibility And Varied Teaching/Learning Strategies

by

Daniel C. White

Cluster XLII

A Practicum I Report presented to the Ed.D Program in Early and Middle Childhood in Partial Fulfillment of the Requirements for the Degree of Doctor of Education

NOVA UNIVERSITY

1993

IR016935

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Daniel C. White
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

BEST COPY AVAILABLE

PRACTICUM APPROVAL SHEET

This practicum took place as described.

Verifier: Brad Hamilton

Brad Hamilton

Principal, Addison Middle School

Title

Addison, Michigan 49220

Address

April 2, 1993

Date

This practicum report was submitted by Daniel C. White under the direction of the adviser listed below. It was submitted to the Ed.D. Program in Early and Middle Childhood and approved in partial fulfillment of the requirements for the degree of Doctor of Education at Nova University.

Approved:

Date of Final Approval of Report

Dr. G.H. Lowen

Acknowledgements

One draws strength and encouragement from many sources. I would like to take this time to thank those who gave a little of themselves that I might succeed.

I thank my Lord Jesus Christ who said, "Seek ye first the kingdom of God and all other things will be added unto you." If I put Him first in my life and follow his commandments, he will hear my prayers. When I called upon him for strength and endurance, He answered me abundantly and I was truly blessed.

My family, Josephine and Adam, were very patient and understanding. They were supportive of my goals and ambitions, while enduring my time away from family matters. I would like to thank them for their love and steadfastness with regards to my schooling and this practicum.

Mr. Brad Hamilton, my supervisor, has always been available to share ideas and offer encouragement. Without his support and direction, I would never have attempted this task.

I would like to thank Ms. Karen Yager, our school secretary, who worked patiently with me to proofread and retype the practicum. Her technical assistance was extremely valuable.

My advisor, Georgianna Lowen, would direct me and guide me when I should have been able to read the same thing in the practicum guide. Thanks for your encouragement and your constructive criticism.

Daniel C. White

TABLE OF CONTENTS

ACKNOWLEDGMENT iii

TABLE OF CONTENTS iv

LIST OF TABLES vi

LIST OF FIGURES vii

Chapter

I INTRODUCTION 1

Description of Work Setting and Community 1
Writer's Work Setting and Role 4

II STUDY OF THE PROBLEM 5

Problem Description 5
Problem Documentation 6
Causative Analysis 11
Relationship of the Problem to the Literature . . . 13

III ANTICIPATED OUTCOMES AND EVALUATION INSTRUMENTS . . . 17

Goals 17
Expected Outcomes 18
Measurement of Outcomes 19

IV SOLUTION STRATEGY 22

Discussion and Evaluation of Solutions 22
Description of Selected Solution 25
Report of Action Taken 27

V RESULTS, DISCUSSION, AND RECOMMENDATIONS 31

Results 31
Discussion 37
Recommendations 39
Dissemination 40

REFERENCES 42

Appendices

		Page
A	STAFF QUESTIONNAIRE ON EDUCATIONAL TECHNOLOGY	43
B	STUDENT EVALUATIONS	46
C	TEACHER EVALUATION FOR ALL INSERVICES	50
D	MAP OF PROPOSED MOVE OF COMPUTER LAB	53
E	AGENDAS FOR INSERVICES	55
F	CHECKLIST FOR OBSERVATIONS IN THE COMPUTER LAB	75
G	FOUR STRANDS OF COMPUTER EDUCATION - ADDISON MIDDLE SCHOOL CURRICULUM	77
H	ADMINISTRATIVE RESPONSE TO INSERVICES	80

LIST OF TABLES

Table		Page
1	Results of Staff Questionnaire on Educational Technology	8

LIST OF FIGURES

Figure		Page
1	Results of 1990-91 Review of Computer Lab Hours	11
2	Goals and Results of Practicum - Computer Lab Hours . . .	34

ABSTRACT

Improving the Students' Use of Computers Within the Middle School Curriculum Through a Multi-Facetted Approach of Increased Computer Accessibility and Varied Teaching/Learning Strategies. White, Daniel C., 1992: Practicum Report, Nova University, Ed. D. Program in Early and Middle Childhood Education. Inservice Training/Cooperative Learning/Middle School Education/Computer Education/Curriculum

This practicum was designed to improve the efficient use, by students and staff of a small middle school, of computers in a problem-solving capacity in the core curriculum. This goal was based upon increased computer accessibility, review of the student outcomes and technology curriculum and teacher training.

The writer coordinated the move of the school's computer lab from one location to another, conducted teacher inservice training in different aspects of technology and its application to various subject areas, wrote grants for increased numbers of computers, reviewed and rewrote the middle school technology curriculum, established cooperative and peer tutoring groups within the computer lab.

Analysis of the computer lab utilization records and observations by the writer and his principal indicated that both teachers and students increased their use of computers in the various core curriculum classrooms. Following the teacher inservice training, the teachers exhibited an increase of skills in the use of technology. With the changes in the computer lab and instruction, the students displayed an increase in confidence in their technlogical skills .

Permission Statement

As a student in the Ed. D. Program in Early and Middle Childhood, I do (X) do not ( ) give permission to Nova University to distribute copies of this practicum report on request from interested individuals. It is my understanding that Nova University will not charge for this dissemination except to cover the cost of microfiching, handling and mailing or the materials.

_____ _____

CHAPTER I

INTRODUCTION

Description of Work Setting and Community

A small rural school district in the Midwest is the work setting of the writer of the practicum. The district covers parts of three different counties, drawing most of its students from this large country location. The district is surrounded by four large lakes. These lakes maintain homesites valued in the hundreds of thousands of dollars. However, sprinkled along the agrarian countryside are a number of mobile homes and poor dirt farm homesteads.

The city in which the school facilities are located is very small, about six hundred residents. However. it is the largest community within the district. The school district itself is the largest employer in the area. A number of district's parents are employed by small, usually non-union, automotive parts suppliers. The annual income for most families is approximately $25,000. However, the major financial support for the school is obtained from property taxes on agricultural lands and expensive lake residences.

The school district receives no funds from the state. Thus, the 1,200 K-12 students reflect the diverse socioeconomic background of the community.

The writer is a male, in his sixteenth year of teaching. He is currently teaching three classes of social studies and three classes of computers/technology. The writer has taught at all levels of the educational spectrum and he is certified in both elementary and secondary education. He has instructed classes ranging from an elementary 3-4 split to high school driver education and adult education classes. He has an undergraduate degree in history and a graduate degree in adult education. His family consists of his wife of 19 years, who also teaches first grade, and a thirteen-year-old son. His summers are often taken up teaching driver education in as many as three different school districts at the same time.

Writer's Work Setting and Role

The population that the writer has concern for are the 286 students in the middle school of the district, grades 6, 7 and 8. The students who make up the writer's teaching assignment are mostly Caucasian. A small number of Hispanics and two Black families make up a small minority within the middle school student body. The lower twenty percent of the student population is unstable. Most of this percentage has been in attendance in at least three other schools and are from single-parent homes. The academic skills of the student body ranges from gifted and talented to

trainable special education students. Regardless of their ability, all students will be involved in the writer's computer classes.

Currently, the writer is teaching in his fourth year at the middle school, one of four buildings that make up the school campus. This year, he is teaching social studies at the seventh and eighth grade levels and instructing all middle school students in the computer lab. The computer classes are part of an ungraded experiential program for all students. These students will have a varied experience in home economics, industrial arts and fine arts, in addition to the writer's computer class.

The practicum writer is assigned six classes per school year. The writer's class size is about twenty six students. He teaches from 7:30 a.m. to 2:15 p.m. The building in which the problem exists is twenty years old, designed and built when open classrooms were in vogue. Therefore, each classroom has only three walls, the fourth opens out on to a common area known as the library/media center. The writer's social studies classes open to the common area, however, the computer is far removed from the rest of the classrooms. The computers are in an enclosed classroom down the hall from the main instructional area in the old arts and crafts location.

The writer's building is composed of 15 full-time staff members. Most of the staff teach in a traditional teacher-centered style classroom, with one administrator. The administrator has shown great leadership in introducing new educational concepts, including the use of technology. In order to provide a more educationally sound program, the administrator must share three

staff members from the high school. This makes the scheduling of classes more difficult. Therefore, all special classes, such as computers, are taught in the morning. As a result most academics are reserved for the afternoon. The computers are thus unused between 11:15 a.m. to 2:15 p.m.

Within this description, the writer believes his role to be one of great importance. The writer's main objective is the promotion and application of computers as a problem solving device. His desire is that the computers would be utilized throughout the learning process and the middle school core curriculum.

CHAPTER II

STUDY OF THE PROBLEM

Problem Description

The middle school's students had not applied skills and knowledge of computers, including related technologies, to solve problems in other subject areas of the school's core curriculum. Students did not make the practical application connection between what is being learned in their computer instruction and the benefit of solving problems in other classes using the computer.

Often, the students felt that they were in the computer class simply to fulfill an obligation. The students' long range view was simply to complete the requirements of the computer class and nothing more. Each student was assigned to his/her own computer whenever possible. Even with their own computer, students frequently lacked the necessary skills and self-confidence to exhibit mastery of most operations. Confusion often arose because they were using two different types of computers, utilizing different commands and software programs.

The classroom teachers didn't encourage the use of the computer because they lacked the knowledge of how they function. Besides, accessibility was a problem. The classroom teachers didn't feel comfortable sending students to the lab unsupervised. The school had a very limited number of mobile computers, therefore, the staff didn't attempt to incorporate the computer into their study areas. Even those who did have some knowledge and access weren't encouraged to use the computer because of a lack of software appropriate to their curriculum.

With convenient access to the computers, plus support and encouragement from the classroom teacher, the students should have been using their ability to apply technology to solve academic problems in the core curriculum.

Problem Documentation

Evidence of this problem in hard data terms was supported by observations, interviews, surveys, and past computer lab utilization records. The accumulation of this data came from many different sources and personnel on the staff of the middle school.

The writer's middle school was designed along the open classroom concept, thus it was quite easy to observe other staff members and their classes. As the computer/technology coordinator in the building, the writer was required to take special notice of the problems and successes of technology-related education. Currently, he had observed that the use of computers by the students and teachers was very low in the core curriculum study areas. As he

entered most of the open classrooms, he noticed that the standard use of the available computers was in the making of signs and banners.

As part of the year-end school review of 1990-91, the writer interviewed and discussed these observations with his principal. His principal reminded him of his custom to "drop in" on the various classes as part of his informal observations. The principal agreed with the writer that a problem existed, a failure to use the computers by students and staff within the core curriculum. His conclusions were based on his informal "drop-in" observations.

Both the principal and writer brought their concerns before the building's School Improvement Team. The team is made up of a representative population of parents, teachers and the principal. After listening to the presentation of the writer and principal, the team decided to seek hard evidence to verify the observations. The writer is also part of the School Improvement Team. He wrote and distributed the instrument as directed by the team (see Appendix A). The results are found on Table 1.

The results of the survey indicated that three of the staff members own computers at home, but they have little experience in using educational technology. Five staff members have had some training in the use of computers (workshops, inservices and computer classes).

However, the majority of the staff felt inadequate in their use of computers and needed more training. None of the staff has had training or practical educational experience on the majority of the computers used in the middle school, the Apple Macintosh

Table 1

The Results of A Staff Questionnaire Related to Educational Technology

		Results	
		Yes	No
1.	I have my own computer.	3	12
2.	I believe that learning about computers and related technology will improve the educational experiences for myself and my students.	13	2
3.	I have experienced or observed the use of educational computer software in the regular classroom setting.	7	8
4.	I have had workshops, training, and classes in computers and related technology.	5	10
	If yes, about how many hours of training? Please circle the most appropriate numbers.		
	a) 0-5 hours	0	
	b) 6-24 hours	1	
	c) 1-2 day workshop or seminar	1	
	d) 1 or more college courses	3	
5.	I have had training on our school's computers, the Apple Macintosh.	0	15
	If yes, about how many hours of training? Please circle the most appropriate numbers.		
	a) 0-5 hours		
	b) 6-24 hours		
	c) 1-2 day workshop or seminar		
	d) 1 or more college courses		

		Results	
		Yes	No
6.	I have had training on our school's CD-Rom. If yes, about how many hours of training? Please circle the most appropriate numbers. a) 0-5 hours b) 6-24 hours c) 1-2 day workshop or seminar d) 1 or more college courses	0	15
7.	I have had training on our school's laser disk player. If yes, about how many hours of training? Please circle the most appropriate numbers. a) 0-5 hours b) 6-24 hours c) 1-2 day workshop or seminar d) 1 or more college courses	2 2	13
8.	I have seen, or experienced, the combined technologies mentioned above in a multi-media educational demonstration.	3	12
9.	I have seen, or experienced, the use of Hyper Card in an educational demonstration.	1	14
10.	I am currently using an electronic grading system for my students' records.	3	12

microcomputers. Based on the results of the survey, the School Improvement Team agreed that there is a problem with the use of computers in the classroom and core curriculum.

The writer was the computer teacher for the building and thus set up the computer schedule for the use of the computer lab by the students and the various classes within the school. When reviewing the computer usage records from 1989-90 and 1990-91, the writer noted that the statistics supported his belief that the problem was real.

The writer taught three computer classes a day, sixth, seventh and eighth grades. The average class size was about 25 students per class. Total instruction time thus equals 375 student instructional hours per week (25 X 3 hours a day X 5 days a week = 375 student instructional hours per week). When the 375 weekly student instructional hours were multiplied by 36 weeks of the school year, the total equaled 13,500 hours of instruction time per year. An equal amount, 13,500 hours of computer lab time, was available for students and classroom teachers to utilize as they saw fit.

In the 1990-91 school year, of the 27,000 available student hours, 13,500 were devoted to instruction. While only 675 student hours, or only 5% of the total 13,500 hours available, were used by students or classroom teachers. A large portion of those hours were used by the writer as he utilized the computers to teach academic classes under his tutelage. Another large part was taken up by fourth and fifth grade classes coming to the middle school for computer instruction. (see Figure 1)

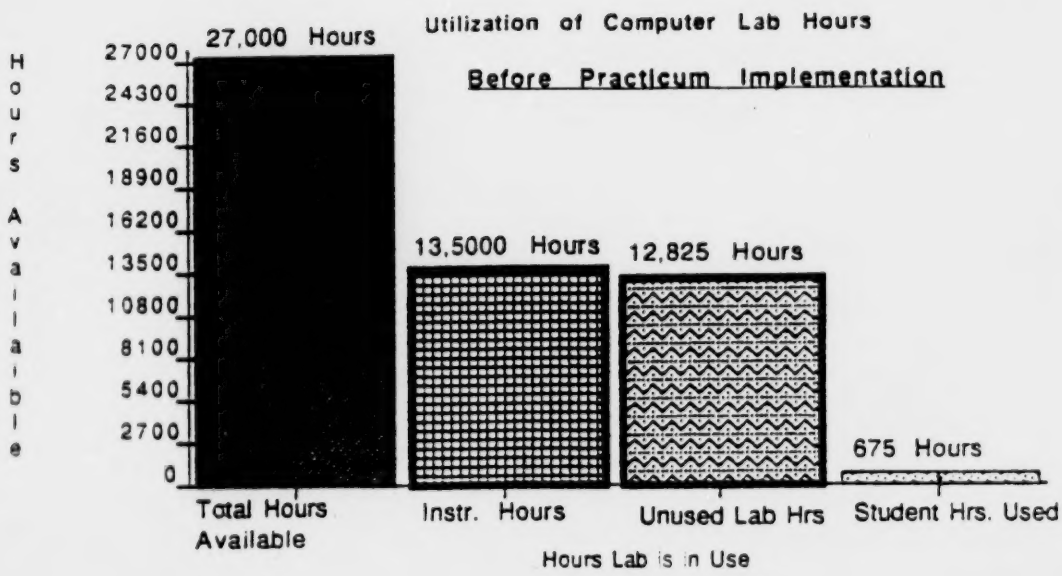


Figure 1

Causative Analysis

Often, when a problem was described, the causes may have been many and varied. This writer's problem statement was no different. He believed that many different causes may have contributed to his building's problem.

The location of the computer lab had a major impact on the problem. The lab was not easily accessible by students and teachers. The current location was not directly associated with the academic classroom structure of the building. Because of the inaccessibility of the lab, the teachers felt uncomfortable sending

the children to the lab. The lack of supervision was a problem perceived by the teaching staff.

According to the questionnaire, most teachers lacked training on the computers used in their middle school building. The teachers were unable to perform some fundamental tasks such as turning on the machines and loading and saving data. As a result of the knowledge gap, the teachers displayed a lack of self-confidence and actually exhibited a "fear" of the computer. This difficulty stood in their way of using the computer in the core curriculum. This was also compounded when they saw their students receiving instruction and acquiring skills that they lacked, thus making them feel less confident in their own abilities.

Another cause of the problem was the lack of coordinated effort or action plan developed by the staff to integrate the computers into their curriculum areas. Any teacher who wished to introduce computers and technology into their subject area did so in a haphazard manner. Very little forethought or preparation had proceeded the use of computers by the staff. The staff was unaware of the capabilities and potential power of multimedia/computers/technology use in the classroom. As a result, little time was spent in exploring their potential possibilities.

The last contributing factor dealt directly with the students and the instruction they received in the computer classes. The writer had observed that even when a student was given his/her own computer to use, they failed to demonstrate confidence in their technology skills. The writer observed that a lack of self-

confidence in ability coincided with the lack of desire to use the computer in the core areas. Part of this perceived lack of confidence stemmed from the use of more than one computer and various software programs during the instruction of certain skills. The multiplicity of different commands often led to confusion and lack of awareness on the students' behalf. As a result, the students often depended heavily on the teacher for correction and direct input into the problem solving process and refused to take responsibility for their own learning.

Relationship of the Problem to the Literature

Some of the identified causes of the writer's problem found some support in the professional literature. One possible cause of the writer's problem was the "fear" that is often expressed by the teaching staff. The literature indicated that the experience of his staff was not unusual.

Cyberphobia is a term used in the literature by Honeyman and White (1987) to describe the anxiety felt by the teachers and their use of computers. Their study suggested that small workshops were not enough to expect the teachers to recover from their "fear." According to this study, the writer's staff was not unusual. Those individuals who had less contact with computers had higher anxiety levels. The authors indicated that at least 30 hours of contact with the computers must be established before the anxiety levels can be reduced.

Over one third of the nation's teachers are not comfortable using computers. However, a solid majority of these same teachers believe that computers can make teaching more effective. These findings are based on a study conducted by the Corporation for Public Broadcasting (1989). The results were based on a study of 2.1 million teachers in 11,500 school districts. The Corporation for Public Broadcasting found that 82% of the teachers surveyed thought computers could improve teaching, while a small minority said that when two students were working on the computer, it was disruptive to the class.

As previously mentioned, the writer's students couldn't see beyond meeting the requirements of the computer class. They failed to comprehend the application implications in their other classes. Again, this may have been due to many reasons, however, Wilson (1986) tended to support the writer's assumption. Wilson (1986) suggested that the students often viewed the computer as a subject of study. Instead, they should have viewed it as a tool to aid them in solving problems. The fundamental mistake was to view the computer as the priority subject material. Many teachers and administrators also had the same misconception. Sometimes, even the computer teachers presented this error in the way they instructed and directed their own class. Wilson suggests that, with proper use and instruction, computers should tie the core curriculum subjects together and not divide them.

Instead of assigning one student to one computer, Cummings (1985) and Chatterton (1985) had to group more than one student around a computer. The reason was a lack of hardware available to

the students. Yet, an interesting result occurred in their study. While emphasizing the discovery and inquiry-based learning, they discovered the students displayed a more active learning, greater group interaction and cooperative decision making occurred among the groups. The implications seem to support Johnson's and Johnson's (1989) assertions that under most conditions, small cooperative groups are more productive in the learning process than individual students. As stated earlier, the writer found that placing students and computers in a one-to-one ratio was not providing the desired mastery.

Guse (1986) offers four questions to be answered when planning a computer program for a building or district. Through his questions, he suggests, without some mission or vision of what the building or district wants to achieve with their computer/technology program, staff and curricula problems will result. Otto (1986) also offers suggestions before implementation of the district plan. He goes a step further and suggests matching goals with student outcomes. "Plan ahead" is his recommendation. Sybouts and Stevens (1986) imply that problems arise because there is no district-wide planning. In order to have a successful integration of computers and technology into the core curriculum, a coordinated effort among all levels must be established. A major part of this plan should include staff development. As noted by the staff survey, the writer's staff had very little training in computer/technology. His staff had very little coordinated action among the 65 teachers in the district. Suppes and Fortune (1985) suggest that a large problem in using computers in the core

curriculum is a lack of planning by the school district. The district that doesn't have a set goal in mind, or a specific plan of how to use the computers, frequently opens itself up to a number of problems. Often, hardware is purchased and given to the teachers to use without proper instructional inservices presented. Pogrow (1985) states that even with some planning, schools must continue to ask themselves, "Is the instructional use of the computer, as it is currently used, really relevant for the future?" He believes that word processing skills are only good in the short run. Computers are better suited for teaching long term skills of importance such as problem solving.

In summary, the literature suggests that the computer used with proper planning will benefit the learning of middle school students. Learning has been enhanced in many core curricula areas such as science, writing and reading if students have computers available and teachers support their use. Along with the use of cooperative learning and teacher inservices, students and teachers will succeed in merging computers into the core subject areas.

CHAPTER III

ANTICIPATED OUTCOMES AND EVALUATION INSTRUMENTS

Goals

The goal of the writer was the desire to have students and staff increase the utilization of the computers in the middle school's core curriculum classes. The students were to use the computer as a problem-solving tool to aid them in their various subjects, while the staff would encourage the use of computers by their students, as well as utilize it as a teaching tool.

First goal: The students and staff will increase the utilization of the available computers and computer lab for problem solving in the core curriculum.

Second goal: The accessibility of the middle school computers will be more available for student and staff use.

Third goal: There will be an increase in the present number of available computers within the regular middle school classrooms.

Fourth goal: The middle school students will demonstrate an increased level of mastery of skills and stronger self-confidence above their entry level into the computer classes.

Fifth goal: The staff of teachers will have an increased working knowledge of the middle school computers, an improvement in an attitude and reduced anxieties toward using computers in their subject areas.

Expected Outcomes

Expected outcome for goal number one: Observations on behalf of the principal and the writer have indicated that the primary use of the computers was the creation of signs and banners. The use of the computers by students as a problem solving tool in the core curriculum, or the use of the computer as a teaching tool did not exist. Following the implementation of the practicum, the writer and principal planned to make five separate observations during the implementation process using a checklist designed by the writer (see Appendix F). The implementation will be considered a success if a simple majority of the statements on the checklist are observed to be positive, on both the writer's and principal's observation instruments.

Expected outcome for goal number two: Computer lab records indicated that available student hours were 13,000, of which only 675 were used by teachers or students. Upon the implementation, the number of requests by students and teachers would increase by about 15%, or about 2,025 student hours.

Expected outcome for goal number three: The middle school had one Apple IIGS computer set up on a cart, available to be pushed from one room to another. This computer was used in the regular

classrooms, not in the computer lab. Following implementation, one more computer for the school would be considered a success, for this would be a 100% increase for the building.

Expected outcome for goal number four: Given a one on one student to computer ratio, the student did not display mastery over the objectives stated for the computer class. Students were always asking questions of the instructor or their neighbor to reassure themselves that they are doing the correct procedure. However, following the practicum implementation, students would ask to use the computer more often, as well as pass a student evaluation with 80% accuracy. (see Appendix B)

Expected outcome for goal number five: As discovered by the survey, the teachers had very little, if any, experience using computers or related technologies in the core curriculum. As a result of the practicum implementation, all teachers would made some lesson plans to use computers in their core subject areas and set target dates to fulfill their commitment. In addition, this will be declared a success if three previously inexperienced teachers, out of fifteen, who have never brought their class to the lab before, will allow them to utilize the facilities.

Measurement of Outcomes

Measurement of expected outcome one: Since the cause was cited by both the principal and writer through their observations, then observations and discussions between the two individuals will be the method of measurement. The discussions are ongoing

informally, as well as formal discussions during staff meetings. Both individuals are looking for the quality of activity in the use of computers. Therefore, to stimulate common ideas to discuss, the writer has developed a checklist that will be used as an aid to the observations (See Appendix F). It is expected that a majority of the statements on the checklist will be positive.

Measurement of expected outcome two: Computer hours are reviewed weekly. The number of students and classes served are added together for total student hours used. Therefore, a positive impact of change as a result of implementation may be evident within a short period of time. Following the three month implementation, the writer will be able to project a possible pattern for the balance of the year.

Measurement of expected outcome three: The first instrument will be the completion of action plans from all the staff. After submission, the second level of measurement is how many, if any, computers are received from the state. If the middle school receives only one computer, it would be a success because it will be one more that is available for student use presently.

Measurement of expected outcome four: Evaluating the mastery skills of the students will take on the form of a post test instrument. An example of these various tests can be found in the appendix section (See Appendix B). These are tentative examples, revisions might take place after the review of the computer curriculum with the district computer coordinator. The writer's desire is to develop an instrument that will have the student "demonstrate" his/her abilities. The lower learning level of factual

recall isn't as important to the writer. Rather, the development and measurement of problem-solving skills is his major objective.

Measurement of expected outcome five: Inservice evaluations are included in the appendices (See Appendix C). Following each learning experience, the staff will evaluate the learning process. A successful inservice is one where a simple majority of the responses on the evaluation is positive. The writer will also informally discuss with the teachers their needs and respond accordingly. The second half of this outcome will be evaluated through the computer records. Plus the fact that this is a small enough staff, the writer will be able to zero in on the needs and desires of the staff technologically.

CHAPTER IV

SOLUTION STRATEGY

Discussion and Evaluation of Solutions

Before discussing solution strategies, it is important to restate the writer's problem. The middle school's students have not applied skills and knowledge of computers, including related technologies, to solve problems in other subject areas of the school's core curriculum. Students have not made the practical application connection between what is being learned in their computer instruction and the benefit of solving problems in other classes using the computer.

Reviewing the professional literature offered some possible solutions. Some of these suggestions are applicable, while others seemed to be impractical with regards to the writer's stated problem. Wilson (1986) believes that the computer lab should refocus its emphasis from the computer being the center of study. The concentration should be on mini-courses of study, using computers that will tie directly into the core curriculum.

Johnson and Johnson (1989) have researched the most effective ways students learn. Their conclusions were that students retained more and learning is increased if they were organized into cooperative learning groups. Computers in the classroom were not part of their study. However, Cummings (1985) and Chatterton (1985), in two separate studies, did use computers in cooperative groups. As stated earlier, they did find great advantages to this learning/teaching style.

Pogrow (1985) states that the use of computers in the schools is important if proper planning is developed for their use. He believes skills, such as word processing, are important for now, however, very little thought of how computers will be used in the future is taking place. Pogrow would place a greater effort on problem-solving skills. Use of computers in developing these skills will have a tremendous consequence for the future.

One of the possible causes of his problem that the writer has cited is the lack of accessibility of computers to the staff and students. Supporting this observation, Watson (1990) states if the core curriculum is to integrate computers into the varied subject areas, direct accessibility is essential. Watson tends to favor individual computers within the classroom as opposed to the computer lab. He realizes, however, that each school has different monetary and hardware limitations, so he also suggests different configurations of equipment ranging from in-room machines, networking and computer labs. Jacobson (1973) indicates that schools should move from establishing computer-assisted

instruction toward integrated computers within the general structure of education.

Kinzie (1988) used a computer-assisted instruction program to try and replicate previous work done on student control over the learning process. Earlier studies suggested that students need to be given some control over their learning. Kinzie used the computer and 98 eighth grade students to determine if the earlier conclusions had any merit. Kinzie found that the students who used computers and the computer-assisted instruction program scored better on the post test than students who had no control over their learning.

Mokros and Tinker (1987) demonstrated that by using middle school students in a computer lab, science-related learning improved. The researchers indicated that the graphing of science-related information improved the student computer skills. This experience also helped increase the students' ability to make judgements based on the graphed materials. One of the methods used was the grouping of students into learning groups, a student-centered approach as opposed to a teacher-centered learning situation.

The use of data base is one of the fundamental concepts taught in computer labs and literacy classes. Suppes and Fortune (1985) indicate that teaching of this skill might better be used if taught within a subject-orientated classroom, such as social studies or science. This would also help to integrate computers into the classroom.

Description of Selected Solution

The solution strategies utilized were varied and intertwined. The writer worked closely with the district's computer coordinator and the Intermediate School District in his county. Together, they established student outcomes for the middle school technology curriculum. The aim was to increase certain skill levels of the students on the computer. As a result, the writer believed the students would be more inclined to use the technology in the core curriculum.

The second part of the solution strategy was the application for the "Classroom of Tomorrow" grants offered by the state. The teachers and the writer met individually to complete action plans as part of the grant writing process. This solution would increase accessibility of the computers by placing them directly in the classroom.

The largest and most difficult part of the strategy was the physical movement of the computer lab to a more centralized location for easier access by the school population. The lab was located in an out-of-the-way location and was to be relocated to the middle of the classroom areas. (See Appendix D) This could only be accomplished after the library was moved to a new room. The solution also included a new classroom management system once the lab was reestablished. The organization of the classroom was transformed into a cooperative learning and peer tutoring environment with a new delivery system by the writer.

Finally, the writer attempted to increase the self-esteem of the faculty through a series of inservice workshops. These were

designed to heighten interest and skills in using the computers as a problem-solving tool in the core curriculum.

Based on the examples offered and the suggestions made by Guse (1986) and Sybouts and Stevens (1986), the writer has conducted a district computer review with the district's computer coordinator. The review reinforced the current role of the middle school program, and identified areas needed to be improved upon. Also, a reexamination of the basic computer components for middle schools, as suggested by the Michigan State Board of Education, was considered. (see Appendix G)

Accessibility of the computers in the lab and computers within the regular classroom was identified as a problem by the writer and Watson (1990). Therefore, the solution took on two different approaches to improve accessibility to students and staff. First, the writer worked with each teacher individually and decide on a plan of action to apply for the state-funded grants, "Classrooms of Tomorrow." These grants placed a computer into each classroom of the teacher with acceptable action plans. The writer filled out the forms and submitted them to the state. Second, the biggest effort of the practicum was moving the computer lab from the present location, the old arts and crafts room, to a more centrally located spot in the open classroom area. This spot was occupied by the library media center. (see Appendix D)

Before the move to the new location discussions were held with the principal, school improvement team and library/media specialist to talk over the plan and iron out the details. The writer also talked over the equipment and manpower needs with the maintenance

personnel before the computer lab and library/media center were moved. The principal contacted the electricians and drew up plans for wiring the computers in their new location, after consulting with the writer.

Report of Action Taken

Improving the level of learning among the students and increasing their self-confidence took place with changes in the operations of the computer lab. For change one, the writer used only one type of computer, Apple Macintosh. The Commodore 64's were distributed among the regular classrooms. This is a change from the previous year when the writer used two types of computers with different software, commands and instructions for operations. This was very confusing to the students.

For change two, the students were organized with two students to a computer. In the writer's school, there is a system of (A) and (B) days according to class schedules. Each student at the computer was assigned an (A) and (B) designation. On (A) days the (A) student acted as the teacher and the (B) student executed the instructions as a student. Half way through the hour, the students reversed the roles. The reason for this procedure is based on the cooperative learning groups of Johnson and Johnson (1989), Chatterton (1985) and Cummings (1985). Also, learning theory indicates that an individual will learn and retain more if he/she has an opportunity to teach the material. The students used self-paced materials called "Student Works."

For change three, as suggested by Wilson (1986), instruction was organized into mini-courses of word processing, CD-Rom, spreadsheets, data base research and Hyper-Media technology. Before the mini-courses started, the writer copied all the programs that were used onto the hard disks of the computers. The writer also wrote lesson plans and obtained instructional materials for the mini-courses that he taught.

The sixth grade learned keyboarding, word processing, CD-Rom and Hyper-Media. Instruction for the seventh grade was a review of word processing, CD-Rom and Hyper-Media, with an introduction to data base research. Eighth graders reviewed all of seventh grade and learned spreadsheet fundamentals. Each year, the students will be given more indepth instruction in all the areas.

For change four, as you might assume, the role of the teacher also changed. The writer implemented two new teaching techniques. The role of the teacher became more of a "guide on the side" and not a "sage on the stage." With the self-paced program and cooperative learning, the need for the teacher to be a fountain of knowledge and lecturing all the time was lessened. The teacher acted more as a facilitator of learning, encouraging, coaching and asking questions, instead of focusing on himself.

The second technique is called "ask three before you ask me." Each student had to ask three other students about a question or problem before coming to the teacher. This helped students take on more responsibility for their learning, and students were teaching each other how to solve their own problems. These techniques created a more student-centered classroom and aided in the

development of cooperative learning groups. Both ideas were gleaned from the Michigan Association of Computer Users in Learning Conference 1990.

The final part of the plan included working with the teaching staff. The principal and writer reviewed the needs assessment and the school improvement team surveys. Then the writer wrote and developed three inservice programs to meet the needs of the staff. The teaching and support staff were instructed frequently throughout the year in many different aspects of computers and their integration into the curriculum. Baer (1987) trained a small group of her staff first, then used these teachers as trainers. Her training was done in a four-day workshop. The writer's plan was also four days long, but spread out over a period of weeks. Three inservice programs were presented and were well received, with more anticipated. (see Appendix E) Following the inservice workshops, an unexpected outcome did occur. Four of the sixteen teachers are attempting to use electronic grade books. Most of these individuals were impressed with the instant grade averages, as well as the various reports and summaries that can be generated.

The writer believes that there were many reasons that these solutions improved the identified problem. First, the writer had the support for change from the principal, library/media specialist and the school improvement team for the physical movement of the computers. Next, the children were eager to use the computers for their regular class assignments. With the easier access of the computers, the teachers have the supervision they want, even if their comfort level in using the machines is still low. Each student

has his/her own disk on file to be used to save documents for any assignment they are working on. With ongoing inservices, the staff was better trained and more confident in their skills in using the computer. In a student-centered classroom, the emphasis is on learning and not just the transmission of information to the student from the teacher.

CHAPTER V

RESULTS, DISCUSSIONS AND RECOMMENDATIONS

Results

In the past middle school students have not applied skills and knowledge of computers, including related technologies, to solve problems in other subject areas of the school's core curriculum. Students did not make the practical application connection between what is being learned in their computer instruction and the benefit of solving problems in other classes using the computer. As a result of this practicum, the writer is confident that he can increase the use of computers by students and faculty within the regular classroom setting.

This problem has been identified as a result of observations by the principal of the middle school, as well as the writer himself. Following these observations, the writer compiled data on computer use. This information supported the existence of the afore-mentioned problem.

In order to have a proper perspective on any discussions and recommendations, it is essential to review the expected outcomes of the practicum and their end results.

Expected outcome one: Following the implementation of the practicum, the writer and principal expected that implementation will be considered a success, if a simple majority of the statements on the checklist are observed to be positive on both the writer's and principal's observation instruments. (see Appendix F)

The principal and writer made five separate random observations, independent of each other, over a nine week period. As a result of the solution strategy, both the writer and principal found their observational checklist to be compatible and agreed that the outcomes had been met. A large number of the statements were observed to be occurring among the students and staff. The first few observations were weak. However, following the changes in the computer classroom learning environment and the first two faculty inservices, the last observations were greatly improved. The implication is that the writer had identified the problem correctly and that the implemented solutions were positive and helpful.

Expected outcome number two: Computer lab records indicated that available student hours were approximately 13,000, of which only 675 were used by teachers of students. Upon the implementation, the number of requests by students and teachers will increase by about 15%, or about 2,025 student hours.

After the computer lab was moved to a more central location, the increased use was readily apparent. Not only were the desired outcomes of increased student hours of 15% met, they were

exceeded by another 15% for a total of 30% increase or about 4,185 student hours of computer use. (See Figure 2)

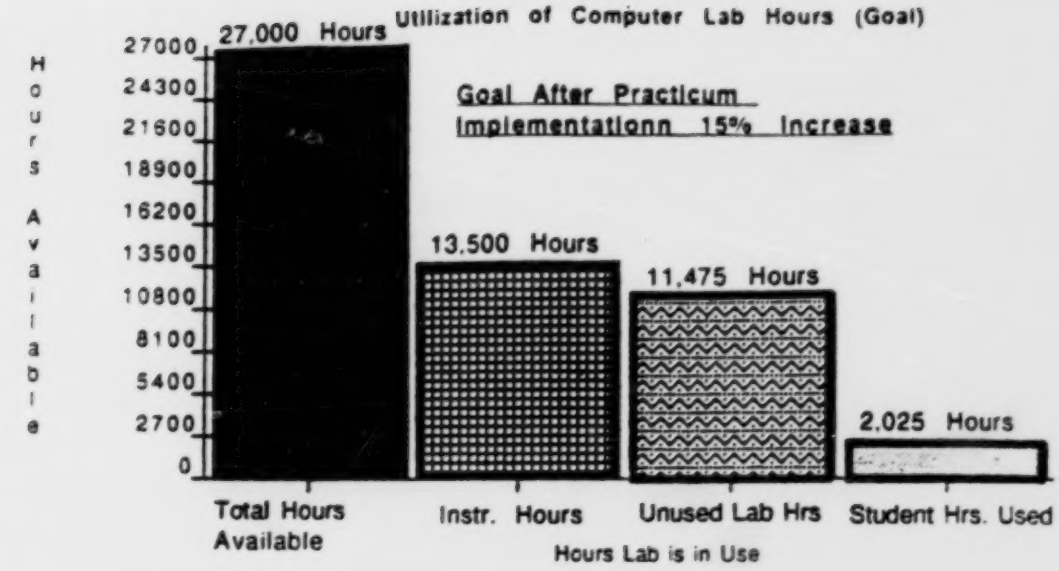
The writer believes that the change in teaching and learning within the technology classroom also led to a greater self-confidence on the part of the students and thus, they were more likely to utilize the equipment for other class assignments.

Following the inservice workshops for the teachers, entire classes began using the lab facilities. The students already had experience using the technology as a result of the writer's computer class instruction. However, with the inservice programs, the teachers were more likely to "take a risk" and use the equipment.

Expected outcome number three: The middle school has one Apple IIGS computer set up on a cart, available to be pushed from one room to another. This is used in the regular classrooms, not in the computer lab. Following the implementation, the acquisition of one more computer for the school would be considered a success, for this would be a 100% increase for the building's classrooms.

Grants for classroom computers were submitted as a result of the writer working with sixteen individual teachers on his staff. These grants were sent to the "Classrooms of Tomorrow" state-funded program. As a result, four of the sixteen grants were approved, thus exceeding the goal by 400%. These teachers now have computers readily available in their classrooms for teacher and student use.

The higher than average rate of approved grants were the result of the writer's investigation into what the grant reviewers were seeking. He discovered that the reviewers were looking for key


Utilization of Computer Lab Hours (Goal)
Hours Available
27000
24300
21600
18900
16200
13500
10800
8100
5400
2700
0
27,000 Hours
13,500 Hours
11,475 Hours
2,025 Hours
Goal After Practicum Implementationn 15% Increase
Total Hours Available
Instr. Hours
Unused Lab Hrs
Student Hrs. Used
Hours Lab is in Use

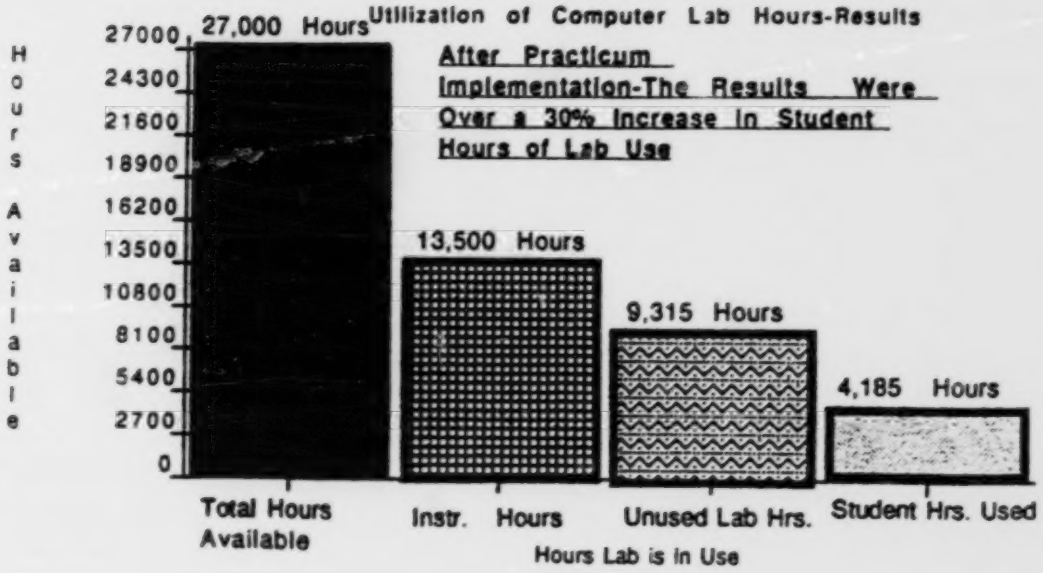

Utilization of Computer Lab Hours-Results
Hours Available
27000
24300
21600
18900
16200
13500
10800
8100
5400
2700
0
27,000 Hours
13,500 Hours
9,315 Hours
4,185 Hours
After Practicum Implementation-The Results Were Over a 30% Increase in Student Hours of Lab Use
Total Hours Available
Instr. Hours
Unused Lab Hrs.
Student Hrs. Used
Hours Lab is in Use

Figure 2

words such as "at risk students", "vocational", "bilingual", and "multicultural." Use of these terms in guiding individual teachers to develop their action plans around these types of programs was beneficial in the grant approval process.

Expected outcome number four: Given one-on-one, student-computer ratio, most students do not display mastery over the objectives stated for the computer class. Students are always asking questions of the instructor or their neighbor to reassure themselves that they are doing the correct procedure. However, following the practicum implementation, students will ask to use the computer more often, as well as pass a student evaluation with 80% accuracy. (See Appendix B)

This outcome displayed mixed results. Following the practicum implementation, the writer has observed a large increase in the use of the equipment by students for projects in their core curriculum classes. However, it was anticipated that the students would be able to complete a student evaluation with 80% accuracy in the computer classes. Currently, the average among students has resulted in a 75% accuracy average rate. A couple of reasons may be identified as possible causes for the lower-than-expected figure. First, the entire middle school technology curriculum has been rewritten with new and different outcomes. It is possible that the nine-week length is too short a time to create a higher level of accuracy. Perhaps the curriculum is trying to cover too much and not enough time is given to mastery of the newer skills. The second reason might be a less-than-adequate delivery of the basic knowledge by the writer to the class. Because of the new materials

and goals for the class, the writer felt less than fully prepared with proper visual aids, demonstrations and review activities.

Even though 75% was less than the outcome goal, this level of achievement is somewhat higher than in years past, even though the writer was working with different outcomes. The reason might be the result of the curriculum review. In the past, approximately 15% of the students put forth little, if any, effort in completing assignments for the computer class. The reason being that the class was ungraded and didn't apply toward honor roll or athletic eligibility. Following the review, these expectations have been reversed. The writer does issue grades, thus he believes this has proven to be a motivational factor to raise the student evaluation level to 75% accuracy. The writer still thinks an 80% accuracy rate is possible and should continue to be a goal to strive toward.

The writer feels that the cooperative grouping and peer learning were extremely successful. The new role of the instructor as a "guide" and not a "sage" was also very beneficial to the classroom setting. He would highly encourage their continuation. The writer does not feel that these two strategies contributed to the lower-than-expected accuracy of student evaluations.

Expected outcome number five: As discovered by the survey, the teachers have very little, if any, experience using computers or related technologies in the core curriculum. As a result of this practicum implementation, all teachers will have made some lesson plans to use computers in their core subject areas and set target dates to fulfill their commitment. In addition, this will be declared a success if three previously-inexperienced teachers out of sixteen,

who have never brought their class to the lab before, will allow them to utilize the facilities.

The writer's fellow staff members have attended four different inservices dealing with technology and computers in the core curriculum. The writer conducted all four training sessions with the aid of two other technology enthusiasts. The training was well received by the staff, and the principal felt compelled to comment (See Appendix H). The culminating activity of the four inservices was the designing of technology-related lesson plans by the staff. These plans have subject matter and target dates built into them. The staff was encouraged by the principal to requisition needed software as it pertains to their core subject area.

As a result of the training, three teachers have brought their classes to the lab and others have sent individual students. One of the most enthusiastic classrooms in the lab is the self-contained, special education class. Other classes include sixth grade social studies and seventh and eighth grade writing classes.

Discussion

Stepping back and looking at the overall practicum results the writer was very pleased. He has seen children light up with enthusiasm as they see their own thoughts, ideas and projects come to life on the computer. Students who often are difficult students in other classes, have come to the lab and accomplished great things. These students often achieved levels beyond their own expectations. The lab has opened up new horizons for the learning disabled and

special education children, often putting them on equal footing with the rest of the student body. The writer's feelings can best be summarized by a passing comment of a fellow teacher, "Boy, you sure have these students turned on to computers and their work."

However, with success often comes other educational opportunities. There is usually a backup for the color computers and printers. Often students will explore to the point that they disable the computer. Then the writer must spend hours or days trying to figure out what the students have done, then try and make it functional again.

The writer's school improvement team has recognized the fact that one series of inservice programs is not enough to keep the teaching staff current and focused on technology. Therefore, some kind of technology inservice will be conducted yearly for the foreseeable future. However, instead of a mass instruction of the entire staff, it has been suggested that the writer work one-on-one or two-on-one for a half day with his fellow teachers.

Also, a semester and yearly review of the curriculum and its time constraints has been suggested. Modifications may be required to meet the students, school and societal needs.

Finally, a periodic review of software utilization should be made before any more major purchases are considered.

Recommendations

The following are broad or general recommendations that the writer would like to make as a result of working through this practicum experience.

1. An individual or school considering similar approaches to solve their technology/core curriculum problem should get a long-term vision as to what they ultimately want from this change.

2. These changes should not be considered or attempted without the total support from the immediate supervisor or principal. The writer credits his principal, in large part, for the success of the practicum, not so much for any direct involvement, but because he had a common vision with the writer, thus giving him wholehearted support.

3. If the movement of equipment is considered, such as the movement of the computer lab and all its machines, the teacher in charge of the lab should be present on moving day. They should be on hand to supervise the packaging and moving of everything. This will help ease the frustration of not being able to locate materials after the move.

4. Clear communications and directions should be established between maintenance and electrical personnel. The writer made the mistake of having the electrical outlets placed too low to the floor. Sixth, seventh and eighth graders are adolescents who are at a physically awkward stage in life. Daily, there are problems of students tripping over the plugs and causing six computers at a time to power down.

5. If a school decides to move their lab into an open area, remember that a large part of a middle school student's life is social interaction. The writer observed students from other classes being distracted by the computer lab students. These distractions also worked in reverse. Therefore, bookshelves were moved in to surround the computer lab. These shelves were just about the height of the seated students, obstructing eye contact. These helped to maintain the focus of all concerned students on the task at hand.

6. Noise may become a distraction or consideration. The writer located moveable acoustical-absorbing office panels that were placed at the openings to the regular classrooms. Similar sound abatement may be desirable.

Disseminating Practicum Results

The writer plans to share the findings with his staff, administration and school board. The writer has also applied for speakership status at the yearly conference of the Michigan Computer Users in Learning. Should this be granted, the writer will share his findings with fellow educators from across the state.

REFERENCES

Baer, Vickie E.H. (1987). Creating a Computer-Using Secondary School Faculty Through Staff Development. Boonsboro Middle School, MD. (ERIC Document Reproduction Service No. ED 294 568)

Chatterson, J.L. (1985). Evaluating CAL in the classroom. In I. Reid & J. Rushton (Eds.), Teachers, Computing and the Classroom (pp. 641-654). London: Manchester University Press.

Corporation for Public Broadcasting. (1989). School Utilization Study: Availability, Use and Support of Instructional Media. Washington, D.C.: Author

Cummings, R. (1985). Small group discussions and the microcomputer. Journal of Computer Assisted Learning, 1, 45-49.

Guse, George A. (1986). Establishing a district-wide computer curriculum. NASSP Bulletin, 37, 6-9.

Honeyman, D., & White, W. (1987). Cyberphobia redux. Journal of Research on Computing in Education, 37, (563-571).

Jacobson, Eric (1973). Putting Computers Into Education. (Report No. LRDC-1973-12). Pittsburgh, PA.: Pittsburgh University, Learning Research and Development Center. (ERIC Document Reproduction Service No. ED 087 477)

Johnson, D., & Johnson, R. (1990). Impact of group processing on achievement in cooperative groups. Journal of Social Psychology 130, 507-516.

Kinzie, M.B. (1988). Learner control and achievement in science computer-assisted instruction. Journal of Educational Psychology, 80, 299-303.

Mokros, Janice R. & Tinker, Robert F. (1987). The impact of microcomputer-based labs on children's ability to interpret graphs. Journal of Research in Science Teaching, 24, 369-383.

Otto, R.C. (1986). Using the curriculum planning process to develop a computer education program. NASSP Bulletin, 70, 1-5.

Pogrow, Stanley. (1985). Instructional uses of computers: Stress problem-solving skills to capitalize on potential. NASSP Bulletin, 69, 47-54.

Suppes, Patrick, & Fortune, Ronald F. (1985). Computer-assisted instruction: Possibilities and problems. NASSP Bulletin, 69, 30-34.

Sybouts, W., & Stevens, D. (1986). A system model for introducing computers. NASSP Bulletin, 70, 28-31.

Watson, Deryn M. (1990). The classroom vs. the computer room. Computers and Education, 15, 33-37.

Wilson, Kara Gae. (1986). Literacy lab mini-courses maximize the curriculum. NASSP Bulletin, 70, 25-27.

APPENDIX A

STAFF QUESTIONNAIRE
RELATED TO EDUCATIONAL TECHNOLOGY

A Staff Questionnaire Related To Educational Technology

DIRECTIONS: Please answer the following questions by circling the items that reflect your current situation as it applies to technology. PLEASE RETURN IT TO A MEMBER OF THE SCHOOL IMPROVEMENT TEAM.

1. I have my own computer.
   YES NO

2. I believe that learning about computers and related technology will improve the educational experiences for myself and my students.
   YES NO

3. I have experienced or observed the use of educational computer software in the regular classroom setting.
   YES NO

4. I have had workshops, training, and classes in computers and related technology.
   YES NO

   If yes, about how many hours of training? Please circle the most appropriate numbers.
   a) 0-5 hours
   b) 6-24 hours
   c) 1-2 day workshop or seminar
   d) 1 or more college courses

5. I have had training on our school's computers, the Apple Macintosh.
   YES NO

   If yes, about how many hours of training? Please circle the most appropriate numbers.
   a) 0-5 hours
   b) 6-24 hours
   c) 1-2 day workshop or seminar
   d) 1 or more college courses

6. I have had training on our school's CD-Rom.
YES NO

If yes, about how many hours of training. Please circle the most appropriate numbers.
a) 0-5 hours
b) 6-24 hours
c) 1-2 day workshop or seminar
d) 1 or more college courses

7. I have had training on our school's laser disk player.
YES NO

If yes, about how many hours of training. Please circle the most appropriate numbers.
a) 0-5 hours
b) 6-24 hours
c) 1-2 day workshop or seminar
d) 1 or more college courses

8. I have seen, or experienced, the combined technologies mentioned above in a multi-media educational demonstration.
YES NO

9. I have seen or experienced the use of Hyper Card in an educational demonstration.
YES NO

10. I am currently using an electronic grading system for my student's records.
YES NO

APPENDIX B

STUDENT EVALUATIONS

SIXTH GRADE

Post-Test for Computer Literacy Class

Use Microsoft Works/Hyper Card/Computer Concepts and your disk to perform the following tasks. Save all materials on your disk and print only when told to do so.

1. Describe the steps needed to format a disk. Explain why this needs to be done.

2. Give two reasons why a computer is helpful to man and society. What functions can it perform better than man?

3. Describe in a paragraph the characteristics of the four generations of computers. Give the names of three machines that led to the development of the modern computer.

4. Use Microsoft Works to type the paragraph out entitled Jake and the Beanstalk or Little Red Ridding Hood. Type it with the mistakes, print it out. Then use the cut/paste, delete key, marked blocks, and spell check to correct the paragraph. Print out the corrected paragraph.

5. Using Hyper Card, create a stack of your choice that has a home card of at least eight buttons, at least eight cards interconnected with buttons, four different backgrounds and at least eight fields of various sizes. Use the video digitizer or scanner to cut and paste at least one picture into the stack.

6. Use the CD-Rom to answer these questions.

   a) Give the name of the house that President Lincoln died in.
   b) From what port city, and on what date, did the Titanic set sail?
   c) List the three names of the American astronauts who died in a fire while still on the ground.

SEVENTH GRADE

Post-Test for Computer Literacy Class

Use Microsoft Works/Hyper Card/Computer Concepts and your disk to perform the following tasks. Save all materials on your disk and print only when told to do so.

1. Using Hyper Card, create a "Choose Your Own Adventure" video/ story book. With the graphics, I want you to create your own setting, such as a haunted house, and allow the reader of your adventure to have at least three (3) choices on every card. Your stack should have at least 16 cards with buttons attaching cards to each other, as well as a main menu button.

2. Using a spreadsheet set up, write the needed formulas to complete the car wash handout.

3. Using the word processor and the addresses I will provide, write a letter to the embassy of a country that you have studied in social studies this year.

4. Using the CD-Rom, video digitizer, scanner and any other available program of your choosing, create a travel brochure for a time traveler who would like to return to ancient Egypt, Rome, Greece.

5. Use the CD-Rom to answer the following questions:

   a) What is the difference in Japanese culture between a Shogun and a Samurai?
   b) What does the term "Ring of Fire" refer to in earth science?
   c) Describe some of the different plans for building an electric car that have been discussed through the ages.

EIGHTH GRADE

Post-Test for Computer Literacy Class

Use Microsoft Works/Hyper Card/Computer Concepts and your disk to perform the following tasks. Save all materials on your disk and print only when told to do so.

1. Using a handout, create a data base of your choice. The data base should have at least 20 records. Develop eight questions with another student. Sort their data and complete their questions. Correct their answers.

2. Using the word processor, write a letter to a famous historical figure, asking them probing questions you would like to know.

3. Use the CD-Rom and the U.S. History disk to try and locate the answers to the above questions.

4. Select a project from the handout and create an interactive Hyper Card stack using laser disks, video tape, video digitizer.

APPENDIX C

TEACHER EVALUATION OF INSERVICES

EVALUATION QUESTIONNAIRE FOR ALL INSERVICES

DIRECTIONS: Please read the following statements. Circle a response below the statement that most clearly conveys your feelings and impressions of the inservice.

1. In general, the inservice had clearly stated goals and objectives.

Agree Disagree

2. As a learner, the inservice provided a variety of learning experiences.

Agree Disagree

3. The instructor met my learning style needs with his presentation of the material.

Agree Disagree

4. As a result of the inservice, I feel more confident in my ability and understanding of educational technology.

Agree Disagree

5. The inservice provided enough practical hands on experiences with the hardware.

Agree Disagree

6. The instructor and inservice provided a good mix of theory and classroom practically.

_____

Agree Disagree

7. As a result of this inservice, I feel I am closer to providing myself and my classroom with a planned technology experience.

_____

Agree Disagree

8. After my experience, I can see possibilities of using computers in my curriculum, either in the computer lab or with one computer in my class.

_____

Agree Disagree

9. List three things that could have improved the inservice.

a)
b)
c)

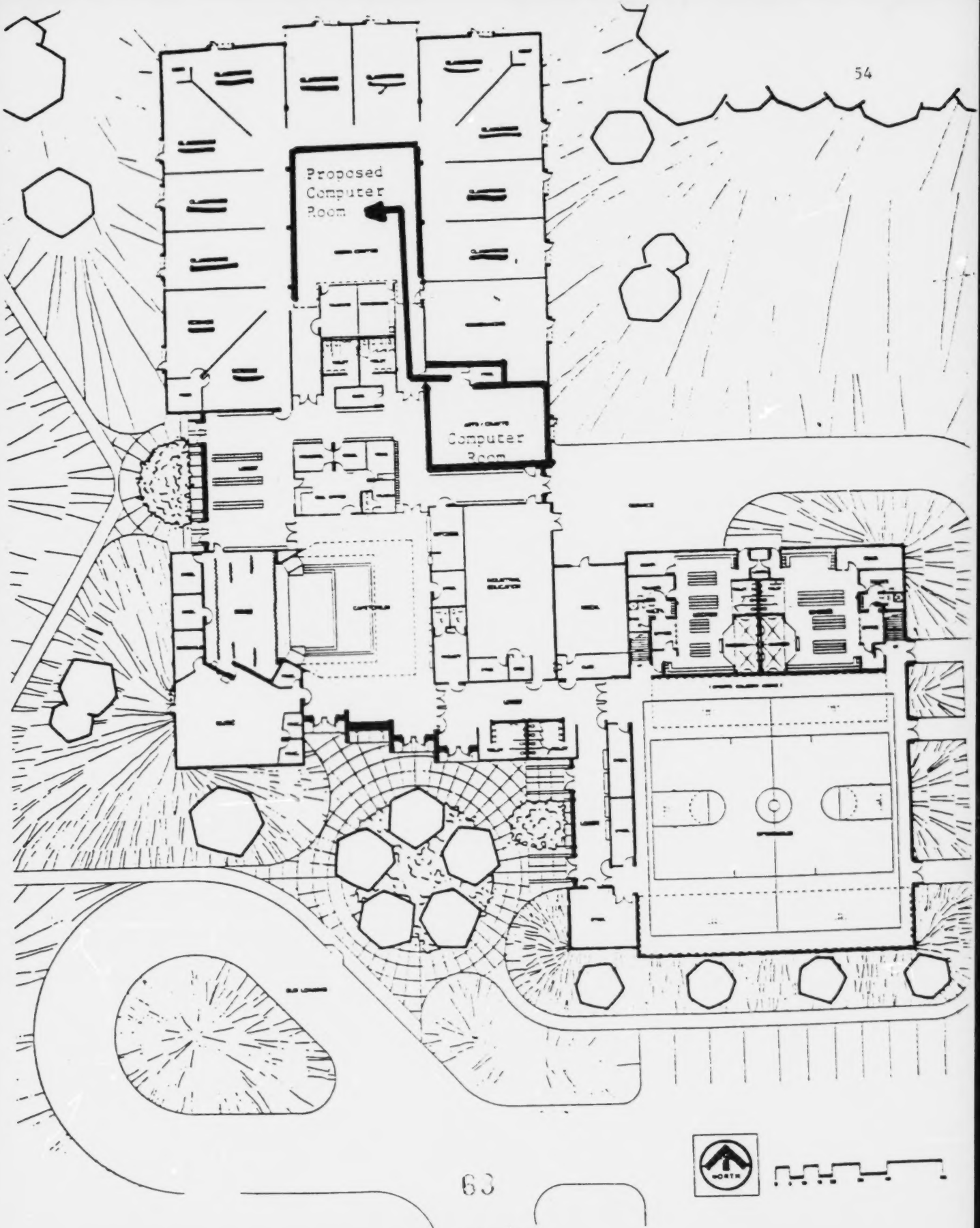
10. List three things that you liked about the inservice.

a)
b)
c)

11. What items should be explored at the next technology inservice?

APPENDIX D

MAP OF PROPOSED MOVE OF COMPUTER LAB



Wakely • Kushner Associates Mt. Pleasant, Inc. / Architects

APPENDIX E

AGENDAS FOR INSERVICE TRAINING

INTRODUCTION TO TECHNOLOGY IN THE MIDDLE SCHOOL

A STAFF INSERVICE

Presented by Daniel C. White

(An overview for the whole staff)

Objectives:

The teachers will be able to:

- Turn on the computer correctly
- Develop seven entry level skills
- Create, save, cut, paste and print a document using Microsoft Works
- Explore the draw capabilities/graphics on the computer
- Tour Hyper Card and see the possibilities of multi-media instruction
- Be able to close down the desktop and Macintosh correctly.
- Operate the CD-ROM player (If it is working?)

Software to be used:

1. Microsoft Works
2. Hyper Card
3. Educators home card

Goals of the Inservice

1. To encourage the staff to become more at ease around the computer.

2. Instill a desire to use the technology center for school-related work, alone or with your students.

3. Become confident enough to permit your students to do projects, assignments and homework on the computer during your class hours. (This means you must have some working knowledge of the computer.)

4. Develop an awareness of some of the capabilities and programs on the Macintosh.

5. Establish a network among the teaching staff so they can go to each other for help and reassurance.

Macintosh Entry Skills
Addison Middle School's Teacher Inservice

TURNING THE MACINTOSH ON:

0. Before operating the computer, adjust the computer and keyboard on the table for your own working conditions. However, please take note the computers are limited in movement by security cables. (Because of Sticky Fingers Hubbard - all items are drawn to his room like a magnet.)

AFTER THE MAC IS OPERATING, DON'T MOVE IT AROUND!!
THIS CAN CAUSE DAMAGE TO THE INTERNAL HARD DISK. (THE SAME KIND OF DISK THAT CAUSES MCDOWELL TO HAVE BACK PROBLEMS.)

1. There is only one power switch on the Macintosh. It is located in the back on the lower left side next to the power plug.

2. Turn the switch on. You should hear a tone and some small sounds from inside the computer. **Don't worry, this is normal.**

3. The screen (or monitor - computer talk) should light up and a "smiling computer" should greet you, followed by a sign that says "Welcome to Macintosh."

4. If this doesn't happen within a few moments, check the power cord under the table to see if it is plugged in. If it is plugged in, is there a red light on the electrical strip? If no red light, then flip the switch on the strip to allow the electricity to flow.

5. If it still doesn't work, unplug all the cords from the computer. You have bad electricity, therefore, you must let it drain from the cord overnight before reconnecting.

6. In a few moments, you should see a gray or white screen. This is know as the desktop. On the desktop, in the upper right hand corner, should be a black rectangle. Under it should read "Macintosh." In the lower right hand corner is a trash can.

Macintosh Entry Skills
Addison Middle School's Teacher Inservice

Entry Skill #1: Pointing

You need to be able to use the **mouse** to move the pointer to any object on the screen. The **mouse** is a small input device that controls the pointer on the Mac screen. The **pointer** is a small shape on the screen that follows the movement of the **mouse**.

Entry Skill #2: Clicking

You need to be able to **click** on any desired object on the screen. Notice that mouse has a button on it. **Clicking is quickly pressing and releasing the mouse button.** When you point to an object on the screen, and you press the mouse button, you're clicking the object. **Clicking makes something happen.** For example, icons (pictures) are selected by clicking on them.

Entry Skill #3: Dragging

You need to be able to **drag** any desired object from one screen location to another. Dragging is the procedure of moving an object on the screen from one location to another.

To drag objects from one place to another:

1. Point at the desired object.
2. Press the mouse button, hold it down.
3. Move the mouse while you watch the object move on the screen.
4. Stop moving the mouse when you get it to the desired location.
5. Release the mouse button.

++

YOU MUST BE ABLE TO PERFORM THE POINTING, CLICKING, AND DRAGGING OPERATIONS IN ORDER TO USE A MACINTOSH.

++

Entry Skill #4: Double-Clicking

You need to be able to **double-click** at any desired object on the screen. A **double-click** is two single clicks in quick succession. You quickly press and release the mouse button two times **without moving the mouse**.

++

DOUBLE-CLICKING IS A MOUSE TECHNIQUE USED TO PERFORM A SHORTCUT, AN EASIER WAY OF OPENING A FILE OR SELECTING.

++

Entry Skill #5: Selecting

You need to be able to **select** objects on the Macintosh screen. Selecting an object is a matter of putting the pointer on the desired object and **clicking** the mouse button. **When selected, the icon turns black.** If you wish to **select** more than one item at a time, use your shift key and **click** the mouse on the items you wish to select while holding the shift key down.

Entry Skill #6: Pulling Down Menus

You need to **pull down** menus. Each item on the menu bar hides a set of commands. To see the commands, you **point** at the desired menu item, **click** your mouse button, and **hold it down.** When you release the button, the menu disappears.

Entry Skill #7: Choosing Menu Items

You need to be able to **choose** menu items from **pull-down** menus. Choosing one of the commands is a matter of **dragging** the pointer to the desired command, stopping and then releasing the mouse button. The action that takes place then depends on what object was **selected**.

Glossary of Terms:

Floppy disk/hard disk:

Folders/Files:

Menu Bar:

Formatting disks:

CONGRATULATIONS
YOU HAVE TAKEN YOUR FIRST STEP IN BECOMING A COMPUTER HACKER

(THIS EVEN INCLUDES YOU, MRS. SUMNER)

NOTES/QUESTIONS/DRAWINGS/SCRATCH PAD

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

_____

_____

_____

_____

_____

_____

(For Mr. Roberts' run on sentences.)

2:15 - EVALUATION OF THE INSERVICE.

Middle School Inservice

Educational Technology in the Core Curriculum

Inservice

Presented by

Daniel C. White

Goals of the Inservice

- The middle school staff will broaden their mind set to explore the possibilities of change within their profession, building, curriculum and classroom.

- The staff will create the foundation of a technology network among themselves. This network will focus on each other's needs as a learner.

- Hopefully, cooperation and self-confidence will result from working together to share ideas and insights with each other. Each staff will have someone they can turn to for help and trust with problems of technology.

Objectives of the Inservice:

1. The staff will be serviced more effectively by dividing them into two smaller groups of seven each. Each group will be divided into cooperative learning groups of two to three each.

2. The staff will be shown a movie entitled, "Paradigms: Change for the Future." The staff will identify various paradigms in education and describe how they have influenced their profession.

3. Staff will identify various ways technology has or will change education.

4. The teachers will review, from the first inservice, and demonstrate their mastery of the word processor by correcting a given paragraph. They will show competency in cutting, pasting, moving, inserting and deleting information.

5. Working in cooperative groups, the staff will explore an electronic grade book, "Grade Machine." Each group will develop a grading scale, assignments and enter grades.

6. Each teacher will explore written materials describing programs that might be used within their respective curriculum. Individuals will list at least five software programs they would be interested in viewing or purchasing for the classroom.

7. Working in cooperative learning groups of two or three, the staff will experience a social studies program called, "International Inspirer." Following the experience, the staff will identify the educational components/skills found in the program.

8. Given five questions to answer, the staff will work in cooperative learning groups to research information on the CD-Rom.

Materials to be used:

1. **Microsoft Works** - Word Processor
2. **International Inspirer** - Social Studies Program
3. **Grade Machine** - Electronic Grade Book
4. **Illustrated Encyclopedia** - CD-Rom disk
5. **Great Workshops, Great Teaching, and the One Computer Classroom Video** - Tom Snyder Publications
6. **Paradigms: Change for the Future** - Lenawee Intermediate School District

Inservice

10:15-10:17 Meet in Dan White's room - #6

Important matters to discuss:

1) When do we eat!

10:17-11:15 View and discuss movie: "Paradigms: Change for the Future."

1) Discuss paradigms in education and their impact on the profession.
2) Identify ways technology is a paradigm and what impact it might have on learning.

11:15-11:40 Lunch

11:40-12:15 Meet in the Computer Lab

1) Review the basics of the Macintosh Computer
   a) Turning the computer on/off
   b) Point - Click - Drag
   c) Load a file from a disk/hard drive
2) Load paragraph from a disk and correct mistakes
3) Print out a corrected copy
4) List ways each teacher could utilize the word processor for themselves and their classrooms

12:15-12:25 Break

12:25-1:15 Meet in the Computer Lab - WHAT IS IN IT FOR ME??

1) Load Electronic Grade Book
2) Load "Dream Class!!" into Grade Machine
   a) Create a grading scale
   b) Create assignments
   c) Input grades and figure averages
3) Create reports for Grades, Progress Reports

1:15-1:25 Break

1:25-1:55 Meet in the Computer Lab

1) In cooperative groups, play three rounds of International Inspirer.
2) Discuss the educational concepts that could be taught as a result of this learning experience.
3) View video - "The One Computer Classroom." Discuss other software that is shown in the movie and how it might be applied.

1:55-2:15 Meet in the Computer Lab

1) Demonstrate how to use and conduct a search on a CD-Rom.
2) Given five different questions, each group will locate the needed information using the computer and CD-Rom.

2:15- Evaluation of Inservice

STAFF INSERVICE

EDUCATIONAL TECHNOLOGY

Presented By
Daniel C. White

GOALS

- Ease the fear and anxieties of the teaching staff as they relate to educational technology.
- Give ample time to explore and spend time experimenting with the available equipment and see how they might be used in your classroom.
- Establish long-term thinking of various uses of computers and technology in the core curriculum.

OBJECTIVES

1) The staff will reacquaint themselves with their network partner to review the major computer-related skills from previous inservices.
2) The staff will develop an action plan for the remainder of this year and develop a strategy for implementation of at least one computer/technology-related lesson for next year.
3) The staff will explore the programs of their choice.
4) The staff will participate in a round table discussion or question and answer period related to educational technology.

Time Schedule

9:00-10:30	-	Review Word Processing
	-	How the CD-ROM Functions
	-	Create an image and print it off on the Video Digitizer/Scanner
10:30:10:45	-	Break
10:45-12:00	-	Develop an action plan for implementation of technology into your classroom.
	-	Explore catalogs and other resources for programs you desire to purchase for your subject area for next year.
12:00-1:00	-	Lunch
1:00-1:30	-	Question/Answer Period
	-	Round Table Discussions
1:30-	-	Free exploration of programs
	-	Take breaks as you need them

ACTION PLAN

TECHNOLOGY/COMPUTERS IN THE CORE CURRICULUM

TEACHER'S NAME _____

Grade You Teach _____

What subject area would you like to use computers/technology in?

_____

What program(s) or technologies do you plan to use?

_____

_____

Do we have these needed items in house or do you plan to order them on your requisitions? _____

Will the students be working: (Circle one or more)

As the whole class Individuals Cooperative Groups

Please give an approximate target date to start. _____

List any needed support that you might require. _____

_____

On the back, please describe or outline in detail what your lesson/ plan is. What do you need to teach before implementation? How will you evaluate the students' learning?

APPENDIX F

CHECKLIST OF OBSERVATIONS IN THE COMPUTER LAB

Observational Checklist for Computer Usage in the Middle School

	Agree	Disagree
1. The students are working cooperatively with each other and with the technology they are using.	_____	_____
2. The students are using their academic time on the computer to improve their skills in the appropriate subjects of the core curriculum.	_____	_____
3. The students are asking to use their own time after school or at lunch to use the computers.	_____	_____
4. Teachers are bringing entire classrooms to the lab to utilize the computers for academic purposes.	_____	_____
5. Students are using the CD-Rom and electronic encyclopedia to research materials for their academic classes.	_____	_____
6. Hyper-Media presentations are being created by students and teachers as alternatives to traditional information presentations.	_____	_____
7. An increase in computer use is evident across the student body and among the teachers.	_____	_____
8. A need exists for additional and updated technological equipment.	_____	_____
9. Teachers are using technology as a means of improving productivity. (Grade books, etc.)	_____	_____

APPENDIX G

FOUR STRANDS OF COMPUTER EDUCATION
ADDISON MIDDLE SCHOOL CURRICULUM

FOUR STRANDS OF COMPUTER EDUCATION

ADDISON MIDDLE SCHOOL CURRICULUM

STRANDS

- Computing And Its Evolving Role In A Technological Society
- Computing Fundamentals
- Computing Applications
- Computer Enhanced Problem Solving

PHILOSOPHY

The main purpose of education is to prepare students to function successfully in the "Information Age." Computers and related technology are an essential part of society and should be integrated into all areas of curriculum and instruction.

The effectiveness of computers and related technology in improving learning depends upon the ways in which they are used. Educators should match appropriate technologies to particular instructional tasks in all curriculum areas. The utilization of computers and related technology involves the successful development of attitudes, concepts, and skills.

For this to take place, all students must have an equal opportunity for a hands-on experience with the computer hardware and software.

NEEDS STATEMENT

Our society is rapidly changing from an industrial-based to an information-based economy. There is need for the schools to respond to this change. Our students will need to be able to work with various technologies in life after school. The schools need to be receptive and aware of how technology can assist them.

The school has a unique opportunity to initiate this educational process with children. The information age demands the use of technology to access and to manipulate the vast amounts of data available to teachers and students. Society will demand a student who can be flexible, demonstrate problem solving abilities and be increasingly responsible for his/her own learning. Life-long learning will become a reality for the next generation of students.

Teachers, in an information-age school setting need to be able to use technology in a variety of ways. The role of the teacher using technology will tend to facilitate student learning. Teachers will be less sources of information and more managers of educational resources. There exists a need for staff support if teachers are to successfully integrate technology into their courses and to use it professionally.

Strand 1

Computing and Its Evolving Role in a Technological Society

A. History of Computers and Computing

Goal: To understand the historical development of the computer.

Objectives: The student will be able to:

1. Identify some major historical computing devices their inventors that led up to the first generation of computers.
2. List the characteristics of the first, second, third, and fourth general computers.
3. Make comparisons among the four generations of computers and summarize their impact on society.

B. Role and Impact

Goal: To appreciate the role and impact of computers in society.

Objectives: The student will be able to:

1. Explain several ways in which computers are used daily in society.
2. List some innovative ways computers are being used now or will be used in the future.
3. Identify some of the ethical issues created by the use of computers.
4. Name and describe several computer-related careers.

5. Evaluate the effect computers have on society and their influence on economic issues.

C. Social Issues

Goal: To understand the current and emerging ethical and social issues raised by the increased use of computers in society.

Objectives: The student will be able to:

1. Discuss the implications of the copyright laws and their relationship to protected/non-protected software.

2. Identify possible effects of illegal use of computers.

D. Future Trends

Goal: To understand and formulate theories about the future evolution and effect of computers and other emerging technologies.

Objectives: The student will be able to:

1. Identify possible changes in computers and other emerging technologies (examples - communication technologies, videodiscs, robotics, CAD/CAM systems, CD-Rom) and recognize the possible impact on the home and work place.

Strand 2

Computing Fundamentals

A. Understanding Computer Systems

Goal: To understand the basic operation, terminology, and parts of a computer system.

Objectives: The student will be able to:

1. Review and define the major parts of a computer system.
2. Define and use appropriate computing terminology.
3. Describe the roles of hardware and software in computer operations.
4. Explain what a computer program is and its role in the computer operation.

B. Operating Computer Systems

Goal: To independently operate a computer system.

Objectives: The student will be able to:

1. Demonstrate keyboarding skills using prepared software.
2. Demonstrate use of essential systems commands.
3. Analyze and correct routine problems encountered in hardware and software use.
4. Create a hard copy of work by correctly loading paper and utilizing the proper printer procedures.

Strand 3

Computer Applications

A. Word Processing

Goal: To understand the creation modification and display of text using work processing.

Objectives: The student will be able to:

1. Name the functions of a word processing package and list some uses for word processing.
2. Enter text into the computer using a word processing program.
3. Edit the text by using copy, cut and paste editing procedures.
4. Print a hard copy using ink jet and dot matrix printers.
5. Load previously stored text into the computer.
6. Store and save prepared data on a floppy disk.
7. Revise previously stored text.
8. Import pictures into text.
9. Create a multi-column text on the word processor.

C. Computer Graphics

Goal: To become familiar with computer graphics.

Objectives: The student will be able to:

1. Create a design using a prepared software package (BannerMania) or Computer Language (Logo).

2. Use the drawing tools inside the word processor and Hyper Card language.

3. Use the Kid Pix program to draw, save pictures and maps.

C. Computer Programming

Goal: To stimulate creative problem-solving techniques and become familiar with the thought process related to computer programming.

Objectives: The learner will be able to:

A. Logo programming

1. Prepare the computer to use Logo. Place a copy of the Logo language in the computer's memory.

2. Use primitives to move the turtle around the screen.

3. Use primitives and define a procedure and super-procedure.

4. Use logo editor to correct lines and procedures.

5. Load and save procedures to and from a disk.

B. Hyper Card

1. Open a stack using the double-click command.

2. Use buttons to navigate: linear and branched.

3. Delete information from a field.

4. Enter information into a field.

5. Define and identify examples or word wrap.

6. Select objects (fields and buttons).

7. Identify objects that have been selected.

8. Use the tools palette.

9. Identify the browse tool, button tool and the field tool.

10. Change the name of a button.

11. Use command-space bar to show the menu bar.

12. Resize a field.

13. Use a regular polygon tool to draw a circle.

14. Use the "Undo" command.

15. Use the "Draw Fill" command.

16. Use the "Patterns" menu.

17. Select and reposition a graphic.

Strand 4

Computer Enhanced Problem Solving

A. The Computer As A Problem-Solving Tool

Goal: To understand how computer-related tools can be used in the problem-solving process.

Objectives: The student will be able to:

1. Use the computer as a tool to solve problems in related program areas by using word processing, Hyper Card, CD-Rom data bases for other classes.

2. Determine an appropriate course of action and evaluate the results of the action when a problem is presented by using the Lego-Logo program.

3. Apply computer-related knowledge to create projects in an "introduction to robotics" segment of the technology class.

4. Solve problems in other content areas while using problem-solving techniques learned in the computer class.

5. Use the CD-Rom and CD-disks to research information to solve a given problem.

6. Create solutions based upon Bloom's Taxonomy of thinking skills.

APPENDIX H

ADMINISTRATIVE RESPONSE TO INSERVICES

MEMORANDUM

DATE: _____ RE: INSERVICE.

TO: DAN White

An At DAN. We have a wonderful start. You Did a great job. I need your assessment of where to go from here.

Thanks

SIGNED: Brad.

TOPS FORM NO 4150

MEMORANDUM

DATE: _____ RE: Tech inservice

TO: Dan White

Just a quick belated note to let you know that I think the inservice was a great success. I'm glad to have you on staff. Thank you for a great learning experience.

99

SIGNED: Brad.